

# SMITHSONIAN Zoogoer

Published by **FRIENDS OF THE NATIONAL ZOO**

NOV | DEC | 2010

## water WORLDS

The Zoo is home to a host  
of aquatic creatures.

- » Pathology Lab
- » Conservation in  
Gabon
- » Wild Holiday Gifts





Good day.

Great day.



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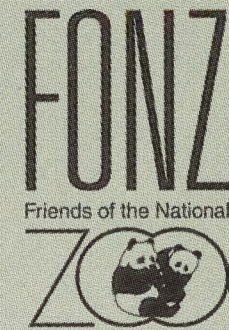
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**BY VALERIE MAY**

In a corner of central Africa, hippos surf the waves and gorillas roam the forest. And wells extract oil. How do nature and industry live in harmony?



# SMITHSONIAN Zoogoer



is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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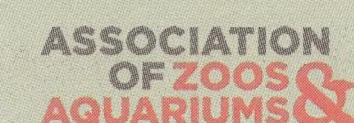
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**On the cover:** A discus swims in the Amazonia exhibit.  
PHOTO BY MEGHAN MURPHY/NZP



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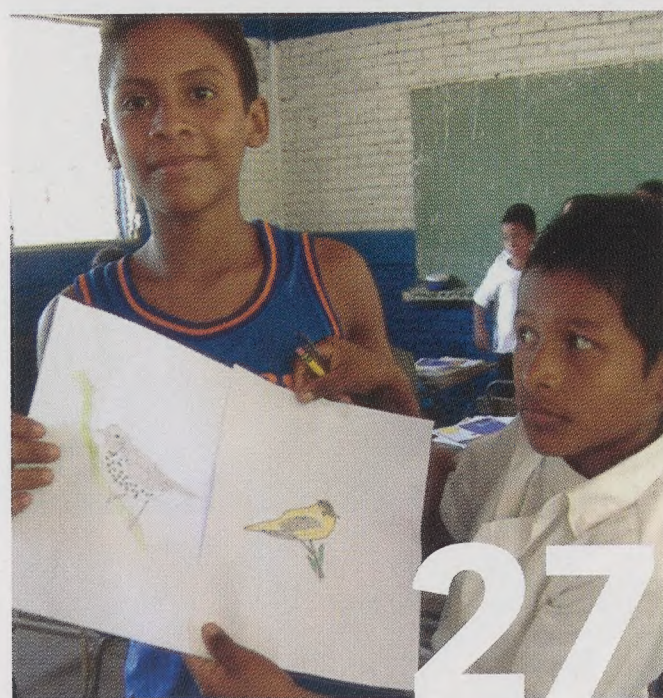
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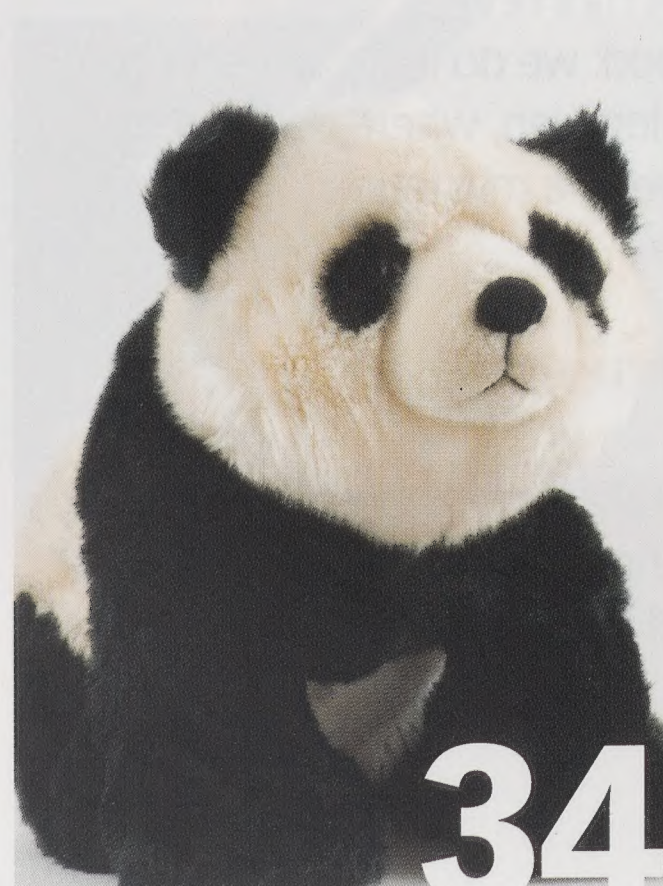
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## ZOO WITHOUT WALLS

### ELEPHANT RESEARCHERS IN SRI LANKA, VETERINARIANS IN KENYA, FROG RESCUERS IN PANAMA—WHAT DO THEY ALL HAVE IN COMMON?

They're examples of fieldwork undertaken by scientists from our Smithsonian Conservation Biology Institute (SCBI). Over time, SCBI scientists have contributed to "the increase & diffusion of knowledge"—the Smithsonian's mission since 1846—on every continent around the globe.

In the late 1960s, the National Zoo began ecology and behavior studies on the reclusive Asian elephant in Sri Lanka. The research continues today on the 30,000 to 50,000 Asian elephants left. Technology is helping us learn much more about their lives. Radio and satellite collars used to track Asian elephants reveal how much space and what kind of resources they seek out in range countries. The data we have collected helped us design our new Elephant Trails exhibit to better accommodate the needs of our three Asian elephants. In addition, it equips us to help range-country authorities better manage reserves and national forests. Our fieldwork in Sri Lanka and Thailand also includes teaching the next generation of scientists and conservationists. We still have much to learn about these endangered behemoths, and time is running out.

A few years ago, a team from the Zoo journeyed to Kenya to study kori bustards, the largest birds that can fly. They learned ways to capture the birds without harming them and to draw blood for examination. Knowing what the blood of a normal animal looks like is essential for detecting abnormalities. A follow-up team went to Kenya last year to build on the original research—and to exchange knowledge with Kenyan ornithologists.

A more recent research project has taken scientists to Panama to help save amphibians, the fastest declining vertebrate class in the world. Since 1980, at least 122 species have gone extinct. *Batrachochytrium dendrobatidis*, a lethal fungus better known as chytrid, is devastating frog populations. The National Zoo's Panama Amphibian Rescue and Conservation Project is trying to collect frogs not yet infected by chytrid. We use sea-shipping containers converted into species-saving arks to protect uninfected amphibians. Thanks to this fieldwork, the Zoo has large insurance populations of species that are now close to extinction in the wild.

These, of course, are just a few of countless examples of SCBI scientists at work in the world. The depth and breadth of our fieldwork truly make us a zoo without walls and distinguish us from many of our sister institutions. I hope you will join me in taking pride in the Zoo's abundant field research, which enriches our understanding of the animals in our care and boosts our ability to conserve them in the wild.

Sincerely,

Dennis Kelly

Director, Smithsonian's National Zoological Park



MEHGAN MURPHY/NZP



## A SPECIAL SEASON



**“A GOOD TIME: A KIND, FORGIVING, CHARITABLE, PLEASANT TIME.”** That’s how Charles Dickens saw the festive season that wreathes November and December. It was, he wrote, “the only time I know of, in the long calendar of the year, when men and women seem by one consent to open their shut-up hearts freely...”

We all celebrate this kind time in different ways, yet certain themes stand out. We count our blessings. We express love through gifts. We reach out to those in need. And we support worthy causes.

Here at the Smithsonian’s National Zoo, we’ve had many blessings this year. They include seven lion cubs, two kiwi chicks, a pair of clouded leopard babies, the opening of Elephant Outpost, more than two million visitors, thousands of devoted volunteers, and the launching of the Smithsonian Conservation Biology Institute. And, of course, we can’t forget you and the 41,000 other FONZ members, whose support is essential to the Zoo’s work.

To express our thanks, we’re remaking ZooLights, our winter festival, into a free event this year—a gift to you and to the whole region. You can learn more at [fonz.org/zoolights.htm](http://fonz.org/zoolights.htm). We hope you’ll come out and enjoy the lights, the new fun activities, and of course the animals. And know how much we appreciate you!

As you embark on your own gift-giving, please keep the Zoo in mind. The holiday gift guide on p. 34 offers examples of presents that can delight loved ones of all ages while supporting the Zoo’s mission. You might also consider the gift of a FONZ membership or one of our Adopt a Species packages. See the back cover to learn more about those options.

For a truly lasting gift, consider honoring a loved one with a commemorative brick in our new Elephant Trails habitat. For a donation of \$250 or more, we’ll customize a brick and install it in this beautiful new exhibit. You can order your brick at [fonz.org/bricks.htm](http://fonz.org/bricks.htm).

Whatever shape your giving takes this season, may it bring joy to you and to yours. Warmest wishes from all of us at FONZ for this kind, pleasant, generous time.

Sincerely,

Bob Lamb

Executive Director, Friends of the National Zoo



## Lion Cubs Born!

Zoo keepers are practically roaring with pride after the birth of seven lion cubs, which tripled the size of the National Zoo's lion pride. Shera gave birth on August 31 to three females and one male. Naba gave birth on September 22 to two males and one female.

Both sets of cubs have had their initial vet exams and seem to be doing well. In late October, each cub weighed about a dozen pounds. Their blue eyes are focusing, and their teeth have begun to protrude.

The cubs will go on exhibit later this year after they have received their rabies shots and passed a swim test. (Because a moat surrounds the great cats' enclosure, cubs need to be decent swimmers before exploring the yard.)



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

### BIRD STUDY VOLUNTEERS NEEDED —

The Zoo needs volunteers to monitor greater rheas as part of a new, multi-year study of their behavior and communication. Volunteers will watch the birds each day and tally specific behaviors observed.

To learn more or take part, please contact Mike Frick at 202.633.3062 or [frickm@si.edu](mailto:frickm@si.edu).



MEHGAN MURPHY/NZP

### Socorro Dove Chick

Two Socorro doves, extinct in the wild, hatched at the Bird House this past summer. One died, but the other is thriving. "It is indiscernible from its parents," says bird curator Dan Boritt. Keepers distinguish the chick by its friendly disposition.





MEHGAN MURPHY/NZP

## Elephant Outpost Opens

In September, the Zoo unveiled the Homer and Martha Guldelsky Elephant Outpost, an interactive learning zone about endangered Asian elephants. Hands-on exhibits allow visitors to experience elephants' tribulations as they seek safe spaces among growing human populations, to estimate an elephant's size without weighing and measuring it, and to learn what elephant poop can teach scientists.

The opening marked the completion of phase one of Elephant Trails, the Zoo's vast new habitat for Asian elephants. "This massive renovation over a number of years," says director Dennis Kelly, "reflects the Zoo's cutting-edge animal care, breeding, education, and scientific research program designed to help elephant experts and scientists better care for elephants in zoos, while saving these endangered, beloved animals in the wild."

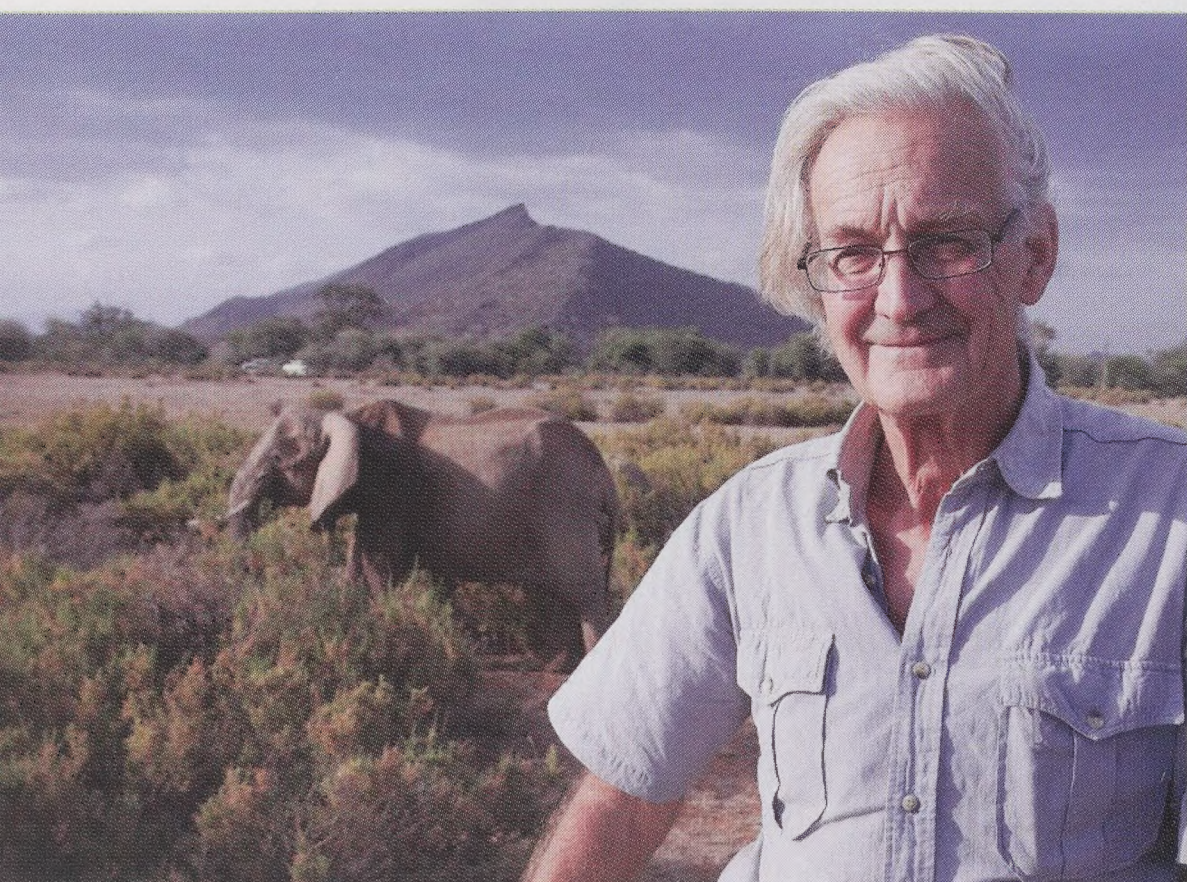
"I think this is phenomenal," says Angela Long, whose family donated the funds to build the Outpost. "It's so much more like their natural environment. It also provides more interaction with the visitors of the Zoo. I can't wait until the whole thing is done. It will be wonderful for the Zoo and the elephants."



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP



LISA HUFFNER

## Elephant Legend Speaks at Zoo

IAIN DOUGLAS-HAMILTON, one of the leading experts on African elephants and founder of Save the Elephants, gave a lecture at the Zoo on September 29. Drawing on decades of work with these beloved beasts, he reiterated his support for a worldwide ban on ivory and stressed the importance of conservation education—particularly in China, one of the world's main consumers of wildlife products. "It is going to be very important to reach Chinese hearts and minds," he said. "I'm convinced of that."



MEGHAN MURPHY/NZP



## Keeper Honored for Article

How do you get a bird who thinks she's a human to reproduce? Keeper Chris Crowe answered this question in "Artificially Inseminating White-naped Cranes," an article in the April-May 2010 issue of *Animal Keepers' Forum*. The story won a Certificate of Excellence in Journalism from the American Association of Zoo Keepers. Congratulations to Chris and his colleagues!

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## Coatis: New Home, Old Furniture

**T**he heavy snows that cloaked Washington earlier this year damaged the white-nosed coatis' enclosure, forcing these mischievous members of the raccoon family to move off exhibit into temporary housing. This fall, the three coatis—two males,



ANN BATDORF/NZP

one female—settled into a new home near the great cats.

With the animals came a large exercise wheel, built for them when they were packing on the pounds in their old exhibit. "Initially it served its purpose really well," says keeper Rebecca Stites. She and her colleagues hope it will help the coatis stay fit in their new surroundings.

Thus far, the coatis are adjusting to their new home well. "They've been busy exploring their area," says Stites. "So far they seem to like it."

**Invertebrate Breakthroughs** Smithsonian Conservation Biology Institute scientist Mary Hagedorn and a team of colleagues at the Hawaiian Institute of Marine Biology may have the answer to stopping a mass extinction of Hawaiian corals. They



MEGHAN MURPHY/NZP

successfully created a frozen bank of coral cells. It will allow scientists to restore species in the wild—even 1,000 years from now.

Invertebrate keeper Mike Henley was the first person to successfully grow two species of anemones in captivity, using techniques learned on Smithsonian field projects.

	AVERAGE FOR EACH ISSUE	ISSUE NEAREST TO FILING DATE
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Other classes of USPS mail	12	6
Total paid/requested circulation	39,743	41,261
Free distribution by mail	100	100
Free distribution outside mail	657	639
Total free distribution	757	739
Copies not distributed	0	0
Total distribution	40,500	42,000
Percent paid/requested circulation	98 %	98 %



## Mark Your Calendar

### Nov. 1 Zoo Winter Hours Begin

Buildings are open from 10 a.m. to 4:30 p.m.

Nov. 18 Lecture on *In The Kingdom of Gorillas*, a book by Bill Weber and Amy Vedder, at 6:30 p.m. in the Visitor Center auditorium.

### Dec. 3-Jan. 1 FREE: ZooLights.

Our annual, Earth-friendly light extravaganza is free this year! Learn more at [fonz.org/zoolights.htm](http://fonz.org/zoolights.htm).

Dec. 25 The Zoo will be closed.

## New (Cold) Blood At Reptile Discovery Center

**E**leven new reptile species are coming to the Zoo from the San Diego Zoo and the Bronx Zoo. Four have already gone on exhibit: the green tree monitor, the Solomon Island skink, the Fiji island iguana, and the Hamilton's pond turtle.

The Solomon Island skink promises to intrigue visitors with its unusual—almost mammal-like—behavior. It lives in a family group, called a circulus. While many reptiles hatch from eggs, these skinks bear live young after six to eight months of gestation, during which time the young reptiles live off a placental sac.

**TEXT to Support Conservation** — Supporting the Zoo's conservation work is now as simple as sending a text message. Simply text "FROG" or "ELEPHANT" to 20222, and you'll contribute five dollars to the Panama Amphibian Rescue and Conservation Project or to the Zoo's Asian elephant conservation program. Learn more at [fonz.org/text.htm](http://fonz.org/text.htm).



## Give Friends and Family the Gift of Conservation

A FONZ membership makes a great gift for anyone on your list. Along with helping to conserve the world's wildlife, a gift membership will also provide recipients with invitations to member-only previews, discounts on event tickets and in Zoo stores, and much, much more. This year's holiday gift membership also includes a limited-edition reusable totebag. Order your membership today at [fonz.org/giftmembership.htm](http://fonz.org/giftmembership.htm).

## Put a Lion Under the Tree

Celebrate the births of our seven African lion cubs with a special holiday lion Adopt a Species package. Not only will this be a great gift for the recipient, but it also is a gift to the animals. Proceeds benefit animal care at the National Zoo. Get Adopt a Species package details and order online at [fonz.org/adopt.htm](http://fonz.org/adopt.htm).





## METAL MAGICIANS

**W**hat happens when something breaks at the Smithsonian's National Zoo? Often, Jeff Perry and Matt Hancock, two inseparable metal workers, come to the rescue. The pair have worked together for more than a decade.

MEHGAN MURPHY/NZP



Their days begin at a 6 a.m. meeting where they get their assignments for the day. Both Perry and Hancock work closely with Zoo keepers who come to the metal shop with ideas for new designs as well as requests for repairs. In order to keep the Zoo running smoothly, “we talk to them every day,” says Perry. “A lot of work is ASAP,” says Hancock. “Everything is really something different.”

Zoo keepers frequently turn to Perry and Hancock in a pinch. Perry was once called in to help an injured emu. An identifying tag on the bird’s leg had somehow become misshapen, and keepers were concerned for the bird’s health. Perry cut the tag free from the emu’s leg with keepers carefully watching over both him and the bird.

One of the pair’s biggest, and most fun, jobs was some behind-the-scenes handiwork for the sloth bears. They enlarged a slide for the animals and installed three new doors so animals won’t come in conflict while moving in and out of their exhibit.

Hancock and Perry’s most challenging project was a crate they made for Happy the Nile hippopotamus when he moved to Milwaukee in September 2009. The 10,000-pound steel crate was designed to make Happy’s move as stress-free as possible. The tricked-out crate came complete with air vents; sliding doors through which Happy received his food, water, and any veterinary treatment needed; and straps that could haul the 5,000-pound hippo back to his feet should he fall in transit. The crate was a huge undertaking—and a huge success. Happy’s move was as smooth as silk.

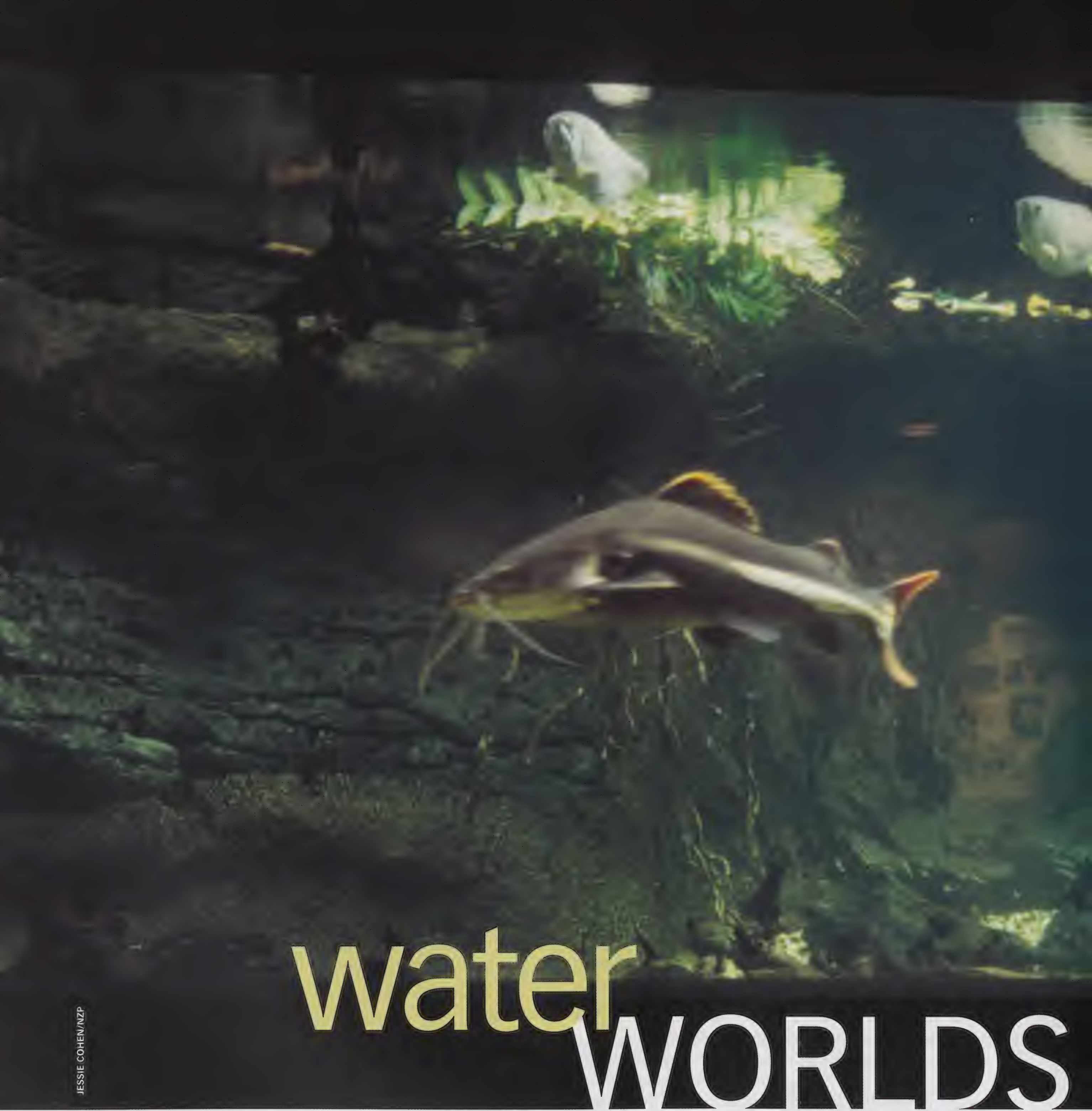
The two artisans face a challenge most metalworkers don’t: dealing with the wiles of determined animals. They have to make sure that their repairs can defeat the clever tactics of some of the Zoo’s skilled escape artists. They must also face the fact that animals won’t always do what humans want.

One day, for instance, Perry and Hancock went to repair a door in the Reptile Discovery Center. They were keen to work, but the king cobra couldn’t be budged out of its enclosure. Keepers tried catching the regal reptile, but it eluded them. The metal magicians could only wait and watch and smile—and realize anew that a Zoo worker’s day always has twists and turns that no one foresaw at the morning meeting.

—DEVIN MURPHY

» In each issue of *Smithsonian Zoogoer*, this “How Do You Zoo?” page will showcase someone who works at the National Zoo. Learn more about careers at the Zoo by visiting the How Do You Zoo? exhibit at the Zoo’s Visitor Center. Children ages five to ten can get a hands-on feel for different jobs at the Zoo. The exhibit is open most weekends from 10 a.m. to 4 p.m.





JESSIE COHEN/NZP

# water WORLDS

Glide through the Amazon with freshwater stingrays. Dive into the Technicolor realm of corals and anemones. Come face-to-face with a giant octopus. Try not to grin as otters perform like they're auditioning for Cirque du Soleil.





BY KERRY GILDEA BECK

You don't need gills, or scuba gear, to take in these underwater wonders. You don't need a plane ticket or passport either. All you need to do is bring your eyes and imagination to the Smithsonian's National Zoo, where aquatic exhibits allow visitors to explore the habitats of water-reliant animals without ever leaving dry land.

"There's actually an aquarium within the Zoo," says senior curator Ed Bronikowski.

"Countless species that live in the aquatic environment are spread in exhibits throughout the Zoo. Many people don't get to travel the world, and even fewer get to peer underwater at exotic places. So we're showing that other world that's the least familiar to our guests."

Here at the Zoo, that least familiar world includes 99 exhibits. They are home to thousands of aquatic animals that live in

and rely on more than 1.6 million gallons of water. Let's amble by a few of the Zoo's water worlds.

### Spineless Wonders

Some of the Zoo's wildest looking aquatic species live at the Invertebrate Exhibit, one of the Zoo's pioneering displays. Before the exhibit opened in 1987, curator Alan Peters explains, zoos generally didn't track or



display invertebrates. “We were the first to put them up front,” he says.

Pointing to a 500-gallon tank where hundreds of coral tentacles wave in the current, Peters says, “We want people to know what invertebrates are, what they do, and why they’re important.” Visitors are invited to “dive” into the 12,355 gallons of water spread out through a variety of tanks to see what invertebrate environments are really like.

Large orange sunflower stars move remarkably fast for sea stars and put on an interesting show at feeding time. Next up

are brilliant pink and lime green anemones coexisting with deep purple sea urchins and majestic blue sea stars, representing the colder regions of the deep. The extreme intelligence of the giant Pacific octopus is another highlight of the exhibit as interpreters and keepers conduct a variety of enrichment and feeding demonstrations.

“People get to the end of the hallway wowed by the diversity,” Peters says, explaining that he thinks of each tank as its own ecosystem. “Tanks are made up of water, gravel, filters, animals that feed and

produce waste all in the same space. It’s a block of water, and we make that block of water become their ocean.”

### A Giant Challenge

Around the corner from the Invertebrate Exhibit stands the Reptile Discovery Center (RDC), many of whose residents require pools of water. These include the green anaconda, the world’s largest snake; assorted crocodilians; and Merten’s water monitor, which is equipped with unusual nostril flaps that keep water out of the animal’s nose when it takes a dive.

Filling all those tanks and pools takes 67,000 gallons of water. And that’s not counting the 10,000 gallons needed to house the Zoo’s newly acquired Japanese giant salamanders in the RDC and on Asia Trail.

Aside from the breathtaking quantities of water needed, there’s also the issue of water quality. “You can’t just drop amphibians in Washington, D.C., tap water,” notes RDC curator Jim Murphy. “They would die.” Amphibians’ permeable skin, he explains, makes them particularly vulnerable to chemicals in their water. “You need to think like a chemist,” Murphy says, “and we have a volunteer on staff with a Ph.D. in chemistry who conducts those water-quality checks.”

Before the salamanders arrived last December, the staff used a very precise process to stabilize the water’s pH and to ensure that water temperatures would replicate the seasonal changes of the animals’ stream habitat.



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

ABOVE: Sunburst diving beetle  
LEFT: Giant Pacific octopus



### Exploring an Ecosystem

Downhill and across the Zoo, Amazonia is a don't-miss destination for lovers of aquatic animals. Holding 62,300 gallons of water, its tanks showcase underwater species from one of the largest and most biodiverse ecosystems in the world.

"The whole Amazonia exhibit is built like an ecosystem," says curator Vince Rico. Visitors get a "full rainforest experience," he adds. Upon entering, people are immersed in the flooded forest, eye level with speckled freshwater stingrays, discus fish, and a somewhat skittish spotted pike characin. Meantime, poison dart frogs chirp from beneath the rainforest plants.

"Wow! You gotta see this!" echoes from a

darkened hallway as visitors turn the corner and encounter the giant river fish pool. The sheer size of the freshwater swimmers—including the air-breathing arapaima, which can grow eight feet long—stuns visitors.

"These fish help us bring home the diversity of the rainforest," says biologist Ed Smith. He sometimes quizzes visitors about how many species of catfish exist locally and throughout the United States. Most people can name one or two. "The Amazon, which occupies an area the same size as the United States, has more than a thousand species of catfish," Smith explains. "This diversity of life is typical of most groups of organisms found in the tropics, particularly the neotropics."



JESSIE COHEN/NZP

LEFT: **Pink-tipped anemone**  
RIGHT TOP: **Green anemones**  
RIGHT BOTTOM: **Sunflower star**



JESSIE COHEN/NZP

### Troubled WATERS

**A**quatic species in the wild face a tidal wave of threats, including pollution, climate change, habitat degradation, and overfishing. "We have a global amphibian crisis," says senior curator Ed Bronikowski, "due to the chytrid fungus"—a lethal organism wiping out whole species of frogs. This has led, he explains, to "a vertebrate extinction rate so rapid and so great it hasn't been seen since the dinosaurs." The National Zoo, he notes, is one of five institutions with an insurance colony of Panamanian golden frogs, now extinct in the wild.

Ocean dwellers also face the prospect of mass extinction. As many of the world's coral reefs die out, Zoo marine biologists are racing to grow corals in the laboratory and in the field. Mike Henley, an invertebrate keeper conducting research on corals, stresses how important invertebrates like corals are as cornerstones for the globe's critical ecosystems. "Corals make up less than one percent of all oceans, yet 25 percent of all marine species depend on the coral reefs," he says. "Reefs and ocean conservation cannot exist without each other. If you lose one, you lose the other."



MEGHAN MURPHY/NZP



“We also feature one of the Amazon’s most infamous fish—the piranha,” says Smith. “Its reputation has been made by Hollywood, when in reality more piranhas have been eaten by people than the other way around.”

Feeding time at Amazonia provides an opportunity to dispel myths. While large size may make one think of fierce predators, many of the river fish rely on vegetation that falls into the water and much prefer bananas, grapes, and lettuce.

Exploring Amazonia isn’t simply a chance to see striking aquatic creatures. It’s an opportunity to appreciate an entire ecosystem—one of the most valuable and vulnerable on Earth. “The awe and wonderment of the Amazon region,” says Rico, “helps people see what they can do to protect this and our own region.”

### Constructing a Coastline

Beyond Amazonia lies a construction zone. It will be home to a revamped



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

LEFT TOP: Green anaconda  
LEFT MIDDLE: Australian snake-necked turtle  
LEFT BOTTOM: Asian small-clawed otters  
RIGHT: California sea lion



MEHGAN MURPHY/NZP



Beaver Valley exhibit, due to open in 2012. The exhibit will be an aquatic extravaganza, with a 300,000-gallon pool for California sea lions, a 125,000-gallon pool for seals, a 27,000-gallon pool for American beavers, and an 8,000-gallon pool for North American river otters.

Visitors to the new exhibit will literally be able to get their feet wet in an artificial tide pool, giving them a more realistic feel for coastal habitats. They may also get a taste of coastal biodiversity. “There is a narrow band on the California coast,” says exhibit developer Cheryl Braunstein, “where the brown pelican, bald eagle, California sea lion, and harbor seal all coexist. Capturing that in a zoo environment would be very special.”

Underwater viewing areas will make it possible for visitors to compare their breath-holding ability with that of seals and sea lions. “We’re pretty closely related to them as mammals,” Braunstein says. “We all like the water; we like to swim. But these mammals can really swim. One of the things we want to capitalize on is the difference between seals, sea lions, and you.”

The new exhibit represents dramatic advances in marine mammal care from when the Zoo’s first exhibit was built more than 30 years ago. “The improvements in life-support systems and filtration have greatly improved,” notes Rico, “and we have more sophisticated husbandry that makes it an overall better existence for all our animals.”

### Invisible Efforts

Ensuring a better existence for aquatic animals is no small challenge. Keeping the Zoo’s water-reliant animals healthy requires sophisticated life-support systems, precise water-temperature controls, proper pH levels, complex filtration, and in many cases reverse-osmosis mechanisms to remove the incoming water’s minerals. For the ocean-dwelling species, salts actually have to be added into their tanks.

The Zoo’s animal-care and operations staffs do everything from monitoring

exhibit-water quality to ensuring that the plumbing, filtration, and complex exhibit-management systems all function properly around the clock. And, like the animals, pumps and pipes also need checkups.

“Just as a doctor listens to a person’s heartbeat to see if he or she is healthy, our team listens to the pumps and pipes,” says Dan Davies, the Zoo’s director of facilities. Zoo workers monitor the water system with the same meticulous care that keepers devote to the health of the animals. Some Zoo veterans can walk into a building and hear straightaway if there’s a problem with a particular tank or filtration system. Yet the Zoo doesn’t simply rely on

well-trained eyes and ears. A system with thousands of sensors is ever ready to alert the staff to any problems.

If the Zoo team is successful, visitors should never realize it. “We hope the visitors never know we’re here,” Davies remarks. “If they’ve had a positive experience, they shouldn’t know the water is running and being pumped. They should feel they are in the animal’s habitat. The glass, the enclosure should go away. It should feel like magic.” **SZ**

—KERRY GILDEA BECK *is a freelance writer and volunteer interpreter at the Amazonia exhibit.*



MEGHAN MURPHY/NZP



MEGHAN MURPHY/NZP

TOP: **Jamie Ramsey** feeds stingrays in Amazonia.

BOTTOM: **Mike Henley** works with corals at the Invertebrate Exhibit.









# big SMALL SAMPLES SCIENCE

BY CRISTINA SANTIESTEVEAN

Microscopes, blood analyzers, and Petri dishes are among the National Zoo's front line of animal-care practices. Tools like these allow the Zoo's pathology department to diagnose illnesses with little more than a drop of blood or a fecal sample.

**O**rigami kangaroos and paper elephant mobiles hang from the ceiling. Chemical-resistant countertops and deep laboratory sinks are reminiscent of high school chemistry class. Three stainless steel refrigerators bear matching signs: "No Food." Above a doorway hangs another sign: "From poop to blood: We do it all."

The sign above the door is absolutely correct. The people who work here, in the Zoo's pathology lab, are essential members of the animal-care team, although they rarely leave the lab or see an animal. Instead, they interact with the Zoo's elephants, clouded leopards, and golden lion tamarins through blood, urine, and stool samples. They gauge an animal's health from the laboratory, by counting blood cells, testing stool samples for pathogenic bacteria, and running countless other tests.

"It's a lot of fun, because you learn all the time," says Ann Bratthauer, a 27-year veteran of the Zoo's pathology department. Bratthauer, Betty Ackerman, and Stephanie Otto are the lab's three technologists. They handle samples from Rock Creek, Front Royal, and Smithsonian field re-

searchers around the globe, and they conduct tests in the clinical pathology lab. The variety of patients is both a challenge and a delight. Some animals are still relatively unknown to science, and every blood test might bring a new discovery. "Everything we do is research," says Bratthauer.

## What's Normal?

Almost every animal at the Zoo will have a sample analyzed in this lab. In total, approximately 5,000 individual cases will be handled by the clinical pathology lab this year. Each will be summarized on a detailed data sheet and filed for future reference. Data sheet number 2010-3599, for example, summarizes routine tests that were recently completed for a female Gila monster. Her test results reveal she's in fine health.

These standard checks are a routine but important part of the monitoring animal health at the National Zoo. Parasite loads are tested at least once a year, and sometimes as often as once a month. Water samples are routinely checked for harmful bacteria. Blood and urine samples allow Zoo staff to track kidney and liver function. If a test comes back abnormal, the



veterinary staff are alerted, and the animal receives medical care.

Most important, however, may be the countless tests that come back as normal. For many animals, researchers are just beginning to understand what typical really looks like. Healthy human blood cells, for example, should be round. Healthy camel blood cells, in contrast, are oval. Without knowing this, a researcher might incorrectly assume that a healthy camel is sick, all based on those oval blood cells.

The differences between animals extend beyond blood cell shape and include practically every measurement that might determine an animal's health, such as blood cell size and count, proportions of red and white blood cells, and hemoglobin content. Each of these parameters in mammals can be measured using the Hemavet, an automated blood analyzer. But the automated results will mean little, unless the team has already determined what typical looks like for that particular species.

"People doctors have no clue how hard it can be," says Bratthauer, who clearly does not mind the challenge. "They have only one species to work with." The sheer number of species is not the only challenge here. There is also the fact that the patients are all wild animals, and many species and individuals are not exactly cooperative with their caregivers.

For example, those clean urine sample cups that human doctors pass out to patients for every routine physical simply don't work here. Instead, urine samples must be collected in whatever way possible, even if it means getting them off the floor.

## DID YOU KNOW

**T**he Smithsonian's National Zoo was the first zoo in the country to hire a pathologist certified by the American College of Veterinary Pathologists. That was in the 1960s. Even today, fewer than a dozen U.S. zoos have pathology departments. Fewer still maintain a laboratory with the equipment found here.

This means the lab technologists must be able to tell the difference between contamination in a urine sample, and an actual symptom. Pollen grains, for example, can look remarkably like parasites when suspended in a drop of urine.

Pollen-contaminated urine samples and oval-shaped blood cells are simply part of the equation for a zoo's clinical pathology lab and the people who work there. "It doesn't matter if it's blood or feces or what have you," says Bratthauer. "It's our job to do it right."

### Learning From the Dead

The laboratory is only one part of the pathology facility. A short walk from the lab is a separate building that is the ultimate destination for every animal at the Zoo. This is where Tim Walsh, the Zoo's head pathologist and self-described animal coroner, conducts necropsies—animal autopsies—on deceased animals.

"Every animal we have will eventually die," says Walsh. Even though zoo animals

tend to live longer than their wild counterparts, none of them will live forever. When they die, it is Walsh's responsibility to determine why.

Whether it is a much-loved Zoo resident or an anonymous wild sparrow, every animal that is discovered dead on the Zoo's grounds is given the same treatment: a thorough necropsy and, often, a microscopic investigation of the animal's tissues and organs. This attention to detail is a necessity in a world where wild animals can transmit their diseases, parasites, and infections to the Zoo's residents. Determining the cause of death for one animal may save the lives of countless more.

Every necropsy shares the same set of goals. First, the necropsy team attempts to learn why an animal died. In particular, the team looks for evidence of disease that might pose a threat to other Zoo animals, or might indicate a larger trend in an animal group or species. If the animal died of normal causes, the necropsy helps develop a better understanding of what normal looks like for that particular species. Finally, the team collects and saves samples that may be used in research projects, for educational programs, or as museum exhibits.

A complete necropsy also includes histopathology—the investigation of tissue or organ samples through a microscope. Some necropsies may also include tests for parasites, toxins, viruses, and more. "Most of our answers come from looking through a microscope," says Walsh.

Thousands of microscopic samples can be preserved from a single two-millime-

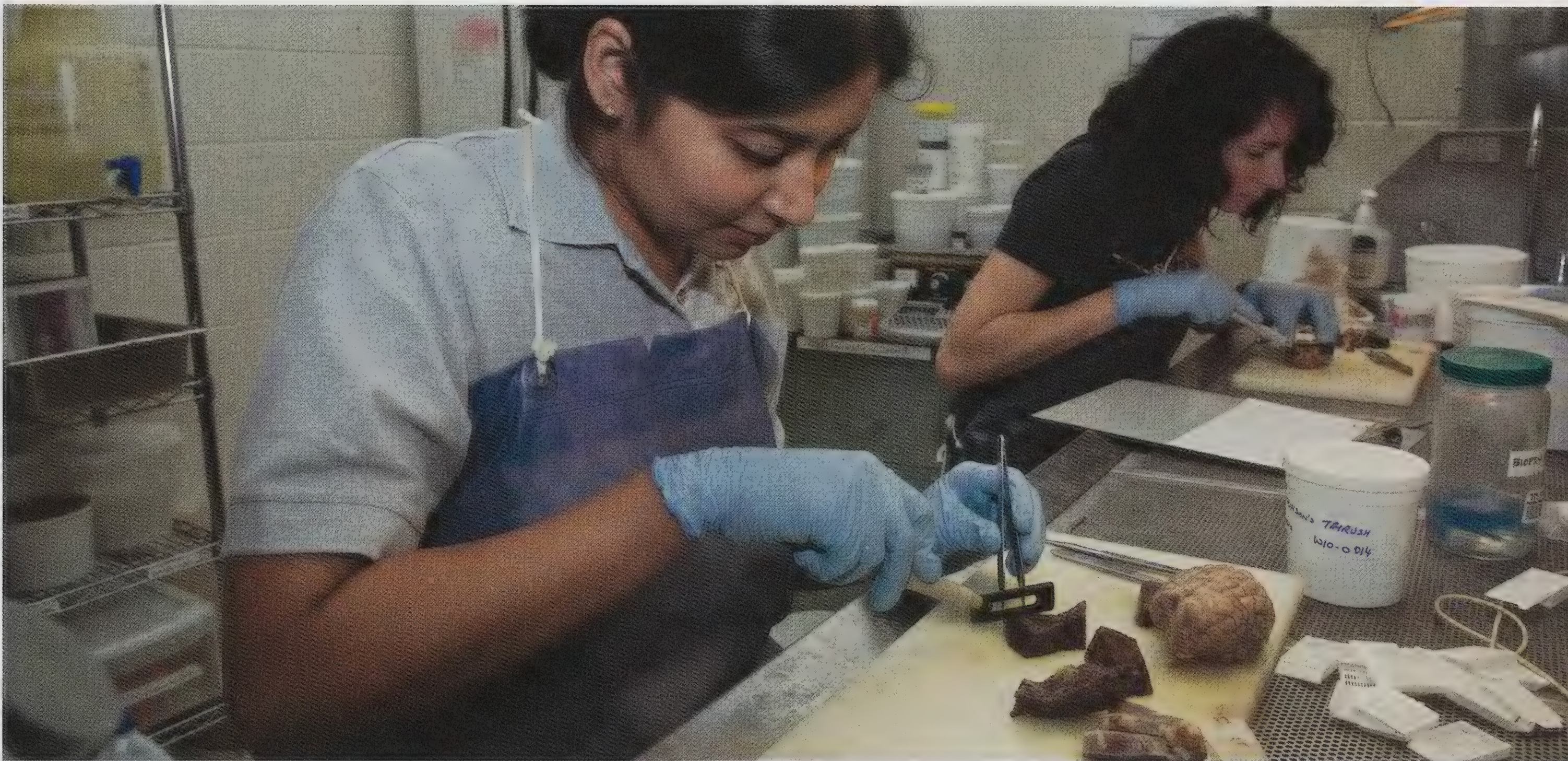


MEGHAN MURPHY/NZP

## Training the Next Generation

**P**racticing veterinary pathology in zoo animals can be dramatically different from working with domestic dogs, cats, or horses. With that in mind, the National Zoo established the nation's first zoo-based pathology residency program. The first resident arrived in 1978. In total, 14 residents have completed their education through the three-year program in the Zoo's pathology department. During their hands-on training, residents participate in every facet of the department's work.





ABOVE: Puja Basu and Esther Langan trim preserved tissues.



ter slice of tissue or organ. Each sample may hold a clue that will ultimately further our understanding of these animals, leading to advancements in their care in zoos, and their conservation in the wild. “We try,” says Walsh, “to learn all we can from the animals, since many of them are so rare.”

### Disease Discoveries

Samples collected from National Zoo necropsies support research and conservation projects around the world. “That’s a whole research project,” says Walsh, pointing at a container that holds the heart of a deceased male gorilla. Heart problems are not humans’ alone; in fact, they are the leading health problem with male gorillas in captivity and a key focus for chief veterinarian Suzan Murray. No one yet knows why. But studying preserved hearts may eventually help a researcher discover the cause for heart problems in male gorillas. Knowing the cause is the first step to developing a treatment.

“Any researcher can ask for samples,” explains Walsh. For example, the Zoo

recently shipped several primate samples to a researcher who is investigating the prevalence of alcoholism—once thought to afflict only humans—in various primates that eat fermented berries. The results might help treat addiction in primates.

Over the years, the Zoo’s pathology department has contributed directly to several important discoveries. For example, when Kumari the elephant died in 1995, the Zoo’s pathology department diagnosed herpesvirus as the cause of death. This was the first documented case of elephant herpes, and it led to the discovery that herpes is a leading killer of elephants, both in zoos and in the wild. Today, the National Zoo is the leader in a worldwide effort to understand the cause and treatment of elephant herpes.

Additional discoveries supported by the Zoo’s pathologists include callitrichid hepatitis (a fatal disease transmitted by mice) in golden lion tamarins and chytrid fungus (a deadly skin fungus that has devastated amphibian populations around the world) in frogs and toads.

These discoveries guide animal-care practices around the world. They also

provide essential insight for conserving wild populations of animals in their native habitat. If zoo pathologists are able to develop a successful treatment for elephant herpes by working with captive animals, their findings may eventually contribute to decisions and actions relating to wild elephant conservation. Likewise, by studying chytrid fungus in zoo amphibians, pathologists advance our knowledge of the condition, and may ultimately help reverse the downward trend of most amphibian populations around the world.

“These animals are ambassadors for conservation and science,” says Walsh of the Zoo’s many residents. That means great benefits come from translating research and knowledge gleaned at the Zoo into helping the species in the wild. “We are not just trying to save an individual,” says Walsh. “We are trying to save a species.” **SZ**

— *Freelance writer-photographer* CRISTINA SANTIESTEVEAN *wrote about clouded leopards for the May-June 2009 issue of Smithsonian Zoogoer.*







An aerial photograph of a winding river flowing through a lush, green landscape. The river is a light brown color, contrasting with the vibrant green of the surrounding vegetation. The river meanders through the landscape, creating a series of loops and curves. The vegetation appears to be a mix of grass and small trees, typical of a savanna or wetland environment. The overall scene is peaceful and natural.

# Oil & Opportunity

BY VALERIE MAY

Can oil and conservation mix?  
A Zoo partnership in Africa  
provides answers—and hope.





**T**here's a little-known outpost of the Smithsonian's National Zoo where forests meet the white sands of the Atlantic, where hippos surf the waves as humpbacks patrol the horizon, and where manatees swim in inland lagoons. Leatherback turtles, weighing up to a ton, lay eggs. Elephants, chimps, and forest buffalo tread the beach; lowland gorillas roam the forest.

This teeming patchwork of rainforests, beaches, savannas, sand dunes, lagoons, mangrove swamps, and wetlands is known as the Gamba Complex. It is one of the most biologically diverse places on Earth. And it lies atop one of the largest known oil deposits in all of sub-Saharan Africa.

### Biodiversity Haven

The Gamba Complex is in southwestern Gabon, a central African nation about the size of Colorado. The complex covers 4,250 square miles and represents the continent's last undeveloped sliver of Atlantic coastal plains. It includes two national parks, an industrial corridor, and the Rabi and Toucan oil fields.

The Gamba Complex is also home to an extraordinary partnership—the Gabon Biodiversity Program. Established in 2000, under the leadership of scientists Francisco Dallmeier and Alfonso Alonso, the program is a joint effort by the Zoo's Smithsonian Conservation Biology Institute (SCBI) and Shell Gabon, with the support of the Gabonese government, to study and protect the region's biodiversity.





CARLTON WARD, JR

much the number of species that makes it special; it's the whole assemblage of environments, from coastal areas, inlets, and immense lagoons to savannas, coastal forests, and dense rainforests" says the newly appointed deputy director of the program, Lisa Korte. "The 'empty-forest syndrome' where the habitat has been emptied of animals due to hunting, is often found in the rainforests of the Amazon and Southeast Asia. Yet in Gabon the forests are still quite vibrant. It's the marvelous existence of the entire ecosystem."

Studying the Gamba Complex, Alonso adds, "helps us to understand nature in an area of low human impact—an opportunity rarely found in the rest of the world. The sizes of wildlife populations are as nature intended. We are able to study life and natural processes as they reveal themselves."

#### Proud Partnership

This entrée into an almost pristine world is the result, paradoxically, of Shell Gabon's presence and partnership with SCBI. "The thing is, they enforce very strict health, safety, and environmental rules in their operations. These protect the landscape, biodiversity, and people" says Alonso.

Shell Gabon uses an "off-shore" approach to drilling, Alonso explains. "They treat these drilling sites as if they were islands." Environmental impact assessments provide a clear process for land use with minimal impact on biodiversity, and management practices enforce human behaviors. Hunting is forbidden, driving speed is limited to 40 kilometers an hour, and night driving is by special permit only.

SCBI scientists and their partners have conducted innovative research on a variety of topics. The first few years, they mapped the biodiversity of the Gamba Complex. They found 374 species of plants, 70 mammals, 78 amphibians, 86 reptiles, 69 fishes, and more than 1,600 insects.

Researchers then started to make sense of the function and connectivity of the landscape by studying the movements of

## Gabon: What Went Right?

Extracting resources—oil, gas, wood, minerals, and more—can put intense pressure on a developing nation. Swelling human populations and the hunger for economic growth often lead to environmental degradation. Yet Gabon has emerged as "one of the more prosperous and stable African countries," according to the *CIA World Factbook*. It is also home to Africa's largest block of virgin rainforest. Indeed, 75 percent of the country's interior is virtually untouched.

Several factors contribute to Gabon's success. Its human population is small (1.4 million) and clustered around three cities. Its economy got a huge boost from the discovery of oil in the 1970s. And its current government has a strong commitment to conservation.



CARLTON WARD, JR

"Our goal is to understand and sustain the biodiversity that is there and to connect people to conservation," says Alonso, who leads the program. "And we work with Shell Gabon to integrate conservation with oil extraction."

SCBI's research and education programs have transformed people's understanding of the importance of the Gamba Complex for biodiversity conservation. "Before we arrived," Alonso says, "people knew mostly about game species and commercially valuable trees, but the vast and complex array of other species was virtually unknown." Scientists have now documented more than 2,000 species in the complex. The list includes a brand-new addition to the known bird world, the olive-backed forest robin.

The true wonder of the Gamba Complex extends beyond species lists. "It's not so



# Oil & Opportunity



BRIAN GRATWICKE

LEFT: Gabonese students take part in an SCBI course on amphibian conservation.

forest elephants, the impacts of roads on wildlife, the effects of invasive fire ants on native species, the impacts of “black spots,” or small oil spills, on biodiversity, the negative effects of forest edges on biodiversity, reducing the spread of nonnative plants, crocodiles and safety, and human-elephant interactions. The program has also conducted many training programs and outreach efforts, including a snake conservation program in residential areas.

A large portion of the research and conservation-outreach programs has been funded through grants from the Shell Foundation and Shell Gabon. Researchers have also benefitted from the professional experience of Shell Gabon employees and from logistical access to otherwise very remote areas. Yet the researchers maintain their “scientific independence,” Alonso stresses. “Results of the data are widely available through publications and reports.”

## Tracking the Trees

SCBI scientist Alfonso Alonso says one of the Gabon Biodiversity Program’s most critical projects is to understand forest dynamics and regeneration under natural and human-induced management in a representative forest in southwestern Gabon. This will be accomplished by establishing a 25-hectare forest-monitoring plot.

The scientists’ work has also benefitted Shell Gabon’s operations. The company has adopted 16 biodiversity recommendations based on SCBI research. “We can advance science, conservation, and education while contributing to impact mitigation and sustainable development,” says Alonso.

### Road Research

One key impact on the environment is the construction of service roads to access locations for oil extraction and transport. Shell Gabon generally builds narrow roads to minimize their effect. Still, roads can be problematic for an ecosystem. They can fragment habitats and provide poachers with access to previously inaccessible places.

What effects are roads having in the Gamba Complex? Previous SCBI work showed that roads had the greatest impact on ungulates, both large and small. Road avoidance was greatest when coupled with local hunting pressure, which fortunately

is almost nonexistent within the Rabi Shell Gabon concession.

To learn more, SCBI scientists recently kicked off a new study. They seek to determine the impact of roads on mammals that weigh two pounds or more and live near the town of Gamba. This fall, a team headed up by SCBI post-doc and French ecologist Hadrien Vanthomme and Gabonese scientist Arnaud Martial Mboutsou Matoka began marking 200 line transects. Each is 1,640 feet long. The transects lie in savannas and forests, both near and far from public roads as well as Shell Gabon’s service roads.

After establishing the transects, the team started walking the lines, recording every animal and animal sign, such as elephant dung or gorilla nests, encountered. This first assessment took place during the rainy season. A second is planned for the dry season, in July through August of 2011.

“We are studying direct disturbance caused by the traffic,” says Vanthomme. “Many species avoid even the edges of the forest next to the road, what is called the ‘edge effect.’ But some species, on the contrary, can be attracted by roads either because it provides new-growth vegetation they can feed on, like elephants, or because they use it as a convenient path in the forest, like leopards.”

The plot will become one of 40 international sites studied by the Smithsonian Institution Global Earth Observatory. The sites monitor forest dynamics around the world and help scientists track the impact of climate change on biodiversity and forest functions. “Every tree as thick as a pencil or larger will be measured and placed on a map for monitoring

purposes,” explains Alonso. “For Gabon, that’s an estimated 250,000 trees.”

“This information will provide a platform for a global carbon-research program that will help us learn how the forest is changing in response to rising atmospheric CO<sub>2</sub>. The plot will also provide an opportunity for capacity building by integrating research and teaching into experiential training.”



The study also relies on camera trapping. Digital cameras set on each of the forest transects are triggered when a source of heat passes in front. “They are especially good for recording nocturnal species like the brush-tailed porcupine, the African golden cat, and the serval,” says Vanthomme.

### Help Wanted

Another key challenge for the Gabon Biodiversity Program is “creating the next generation of conservation practitioners,” Alonso says. That includes training Gabonese biologists and protected-area managers.

The program is undertaking a needs assessment in terms of professional training. That study, Alonso says, will attempt to answer several questions: “Where are the gaps? Where are the resources? And how can we best help Gabon meet this need?”

The need for trained people is especially apparent when looking at Gabon’s national parks. In 2002, then President El Hadj Omar Bongo Ondimba created 13 national parks in a land that had had none. The parks make up almost 11 percent of Gabon’s total land mass.

The action was laudable, Korte says, but not without significant challenges, particularly in terms of infrastructure. “They went from zero to 13,” she explains.

“They literally do not have the boots on the ground to patrol them, and it is murky as to how those national park boundaries are going to be respected.” One of Korte’s prime objectives in her new position is to mentor the Gabonese staff, lead the science and education programs, and “increase the capacity of our Gabonese scientists.”

She will also lead much of the educational outreach program that currently takes place at the Smithsonian Biodiversity Laboratory at Vembo, sometimes called the gateway to the Gamba Complex. “The tropical rainforest, savanna, and wetland habitats are right outside the door,” says Alonso. “So we literally walk out the door and become part of a dynamic ecosystem.”

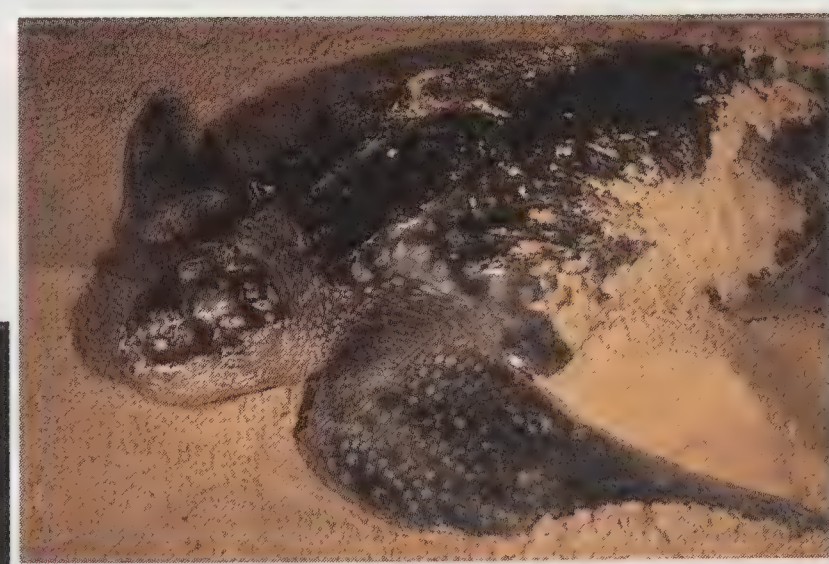
### Memorable Moments

Walking out that door has led both Alonso and Korte to memorable moments. Alonso’s voice warms as he describes “one of the most phenomenal experiences of my life.” He observed a female leatherback turtle efficiently excavating a nest and depositing eggs. “It was amazing to see the way they do it, so fast, so beautiful. She laid her eggs and then pounded the sand with her flippers to close the hole. Very professional. There was no sign at all that the eggs were there.”

Korte’s moment came at the edge between two ecosystems: “The savanna was behind us, and we walked into the forest—where we could hear chimps calling. The chimps disappeared when they heard us coming, and we turned to leave and basically bumped into a lone silverback gorilla. Your instinct is to turn and run—a bad idea. We crouched on the ground and didn’t look at him. You want to be very submissive. He pounded his chest for a bit and then moved on. Gabon offers those kinds of heart-stopping opportunities.”

As the Gabon Biodiversity Program succeeds, the descendants of that silverback will roam the rainforest for generations to come. The chest-thumping might serve as an expression of success that can come when competing interests find ways to work together, forging an outcome that benefits all. **SZ**

— VALERIE MAY *is a freelance writer and web producer, as well as a frequent contributor to Smithsonian Zoogoer.*



CARLTON WARD, JR



CARLTON WARD, JR





JESSIE COHEN/NZP

## SUPERLATIVE Leggiest Zoo Resident

**M**easuring up to 19 centimeters in length, the Vietnamese centipede is one of the largest centipede species in the world. Like all centipedes, it has a segmented body. Each body segment boasts a pair of legs. With 21 segments, the Vietnamese centipede has a grand total of 42 legs.

Vietnamese centipedes use venom to immobilize prey. Unlike most venomous insects, though, centipedes do not inject venom through their teeth. Rather, they use their specially adapted front legs to grasp and inject prey. The venom is not lethal to humans.

You can glimpse a Vietnamese centipede at the Invertebrate Exhibit.

## DID YOU KNOW? The Same Under the Skin

**D**uring a visit to the Zoo, it's easy to tell lions and tigers apart. Lions are the color of their grassland habitat, while tigers sport dramatic black stripes. But the differences between these

large felines are only skin-deep. Skeletally, the animals are so similar that only experts can determine which is which.

That's not as surprising as it might sound at first. All cat species have basically the same

bones, with some variations in size and shape. Lions and tigers, moreover, are similar in size, and they move much the same way. Their skeletons reflect those similarities.

You can visit the Zoo's lions and tigers at the Great Cats exhibit.



JESSIE COHEN/NZP



JESSIE COHEN/NZP



JESSIE COHEN/NZP

## Where in the Zoo?

Only two kinds of lizards are venomous, and this wild skin belongs to one of them. Learn more at [nationalzoo.si.edu/goto/whereinthezoo](http://nationalzoo.si.edu/goto/whereinthezoo).



JESSIE COHEN/NZP

## FACT OR FICTION?

### All Monkeys Use Their Tails to Grab

**FICTION.** Because monkeys have long tails and usually live in forests, people frequently assume that they all use their tails as extra limbs. But in reality, only a few families of New World monkeys, living in Central and South America, have the ability to grasp things using their tails.

The majority of species in the Atelidae family, including howler, woolly, and spider monkeys, have fully prehensile tails that are almost entirely hairless and allow the animals to grab and climb. Members of the Cebidae family, including capuchin monkeys, have partially prehensile tails. Because these tails lack areas of bare skin, they are unable to grip well.

Other species of New World monkeys, including tamarins, marmosets, and sakis, do not have prehensile tails. Nor do Old World monkeys from Africa and Asia, such as colobus monkeys or macaques.





PHOTOS COURTESY OF SMBC

[EDUCATIONAL  
OUTREACH]

## Learning Takes Flight



*Cross-cultural understanding is flying on the wings of migratory birds.*

**S**tudents in North and South America are learning more about birds and each other with the help of a National Zoo program called Bridging the Americas/Unidos por las Aves. It links elementary and middle school classrooms in Washington, D.C., Virginia, and Maryland with classrooms in Latin America. Classes are paired on the basis of migratory birds that connect them.

Workshops provided by the Zoo's Smithsonian Migratory Bird Center (SMBC) educate teachers about local migratory birds and the conservation issues that affect them. Teachers also receive supplementary materials, such as bird photographs, posters, and information about their classroom partner's country.

**To learn more about Bridging the Americas, visit [fonz.org/bta.htm](http://fonz.org/bta.htm).**

Teachers' new knowledge and materials equip them to use birds as a theme for teaching several different subject areas, including science, math, social studies, language arts, and visual arts. "It's neat to see what the teachers do because everyone comes at it from a different angle depending on which subject areas they fit into," says Mary Deinlein, bird conservation and education specialist at the SMBC.

For example, teachers in Spanish-immersion classes used the birds to introduce new vocabu-

lary words and as a theme for writing letters in Spanish to their partnered classes. A class from Forest Knolls Elementary School in Silver Spring won a county award for its video about hazards that birds encounter while migrating.

Art teachers involved in the program have created bird-inspired projects. "Some of the artwork that has come up from Latin America has been just extraordinary," says Deinlein. She displays works by Latin American students in her office. One class of students in Costa Rica made paintings on banana leaf fibers and sent them to their partners in the U.S.

Pat Davis, a teacher at Princess Anne Elementary School in Maryland, has participated in the program for four years. Her students pick birds they would like to study, then research them. She also plays "Migration Headaches" with them—a game that teaches students about the obstacles migrating birds face.

"One of the big things that I've learned from the project," Davis says, "is that the kids don't know many birds at all. They are amazed at the problems birds have when they migrate." To whet students' appetite for avian learning, Davis keeps a feeder outside her classroom. She also plans to continue with Bridging the Americas. "The kids love it," she says.



# HANGING AROUND UPSIDE DOWN

## SLOTH STYLE

- Sloths usually don't make sounds, but they can hiss and moan if they are stressed.
- Sloths are good swimmers and can swim to a different tree if the rainforest is flooded.
- Sloths are good climbers and swimmers, but they cannot walk on the ground. They lie flat and pull themselves along.
- Sloths only go to the bathroom once a week!
- Sloths feed themselves by grabbing food with their feet and pulling it to their mouths.



MEHDIAN WAIRPHY/NZP

JESSIE COHEN/NZP



## Mellow out and meet the sloth — arguably the slowest animal on Earth.

BY PAMELA BUCKLINGER

### YOU DON'T SEE WHAT I SEE »

The world looks different to sloths. That's because they spend most of their lives hanging upside down from tall trees in the rainforests of Central and South America. They sleep, eat, sleep, give birth, sleep, and sometimes even poop while just hanging around.

### ONE-STOP SHOPPING

» Sleeping up to 18 hours a day, sloths don't have time to move much. So it's a good thing that they have everything they need close by. Sloths' favorite snacks (leaves, fruits, and twigs) grow on the same trees that they hang from—just a bite away. And thirsty sloths can just sip water off a leaf.

### IT'S EASY BEING GREEN

» In the wild, the sloth's thick coat of hair turns green. The color comes from algae, tiny plants that grow on the sloth's fur because of moisture in the rainforest. The green color acts as a disguise, camouflaging sloths in the trees from hungry enemies. The algae can also make a handy snack if the sloth's already eaten all the nearby leaves.

### CLAW YOUR WAY TO THE TOP »

Female sloths can have a baby a year. Born while mom hangs upside down, a baby must climb up and cling to mom's belly hair to nurse. By about eight

months old, a sloth is ready to hang on its own.

### SHOP FOR SLOTHS »

Sloths need trees to survive. The rainforests where sloths live are being cut down at an alarming rate. People can help the habitats of sloths and many other animals by buying wood and wood products made from responsibly harvested trees.

**AT THE ZOO »** Hang out at the Small Mammal House or Amazonia to see sloths.

## UP IN THE AIR

Five-year-old **Eliana Dunkin** likes another

animal that spends much of its time

above the ground—the orangutan. She

drew this picture of an orangutan on the O Line at the Zoo.

Eliana also likes pandas and George the donkey at the Kids' Farm.

What's **your** favorite animal? Let us know!

Smithsonian Zoogoer appreciates all the cool animal pictures we received. We'll publish more in future issues. Didn't get a chance to send yours in? No problem! Just send it to Zoogoer@si.edu or mail it to the address below.

Please get a parent or guardian's permission before writing to us and please let us know how old you are.

Smithsonian Zoogoer  
Friends of the National Zoo  
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## FONZ

### FONZ RESOURCES

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Special Events  
202.633.4470

Development Office  
202.633.3033

Camps and Classes  
202.633.4470

Volunteer Services  
202.633.3025

#### Comments? Questions?

Please email us at  
[member@fonz.org](mailto:member@fonz.org)

Not a FONZ  
member yet?  
Call 202.633.3034  
or go to  
[fonz.org/join.htm](http://fonz.org/join.htm)

### 2009 ANNUAL APPEAL UPDATE

#### Clouded Leopards

A brighter future for clouded leopards—that was the goal we set for our 2009 annual appeal. These charismatic Asian cats are among the least known wild cats, and their future is uncertain. That bolsters the importance of the National Zoo's highly successful breeding program. Our Front Royal facility holds the largest population of clouded leopards in North America.

Such a thriving population deserves a good home. So the Zoo drew up ambitious plans for a new clouded leopard habitat in Front Royal. It would include indoor and outdoor areas as well as a pair of 20-foot towers equipped with climbing structures that would allow these arboreal cats to behave naturally.

We're grateful to report that you responded generously to our 2009 appeal, contributing more than \$195,000 toward construction of this important new facility. Thank you!

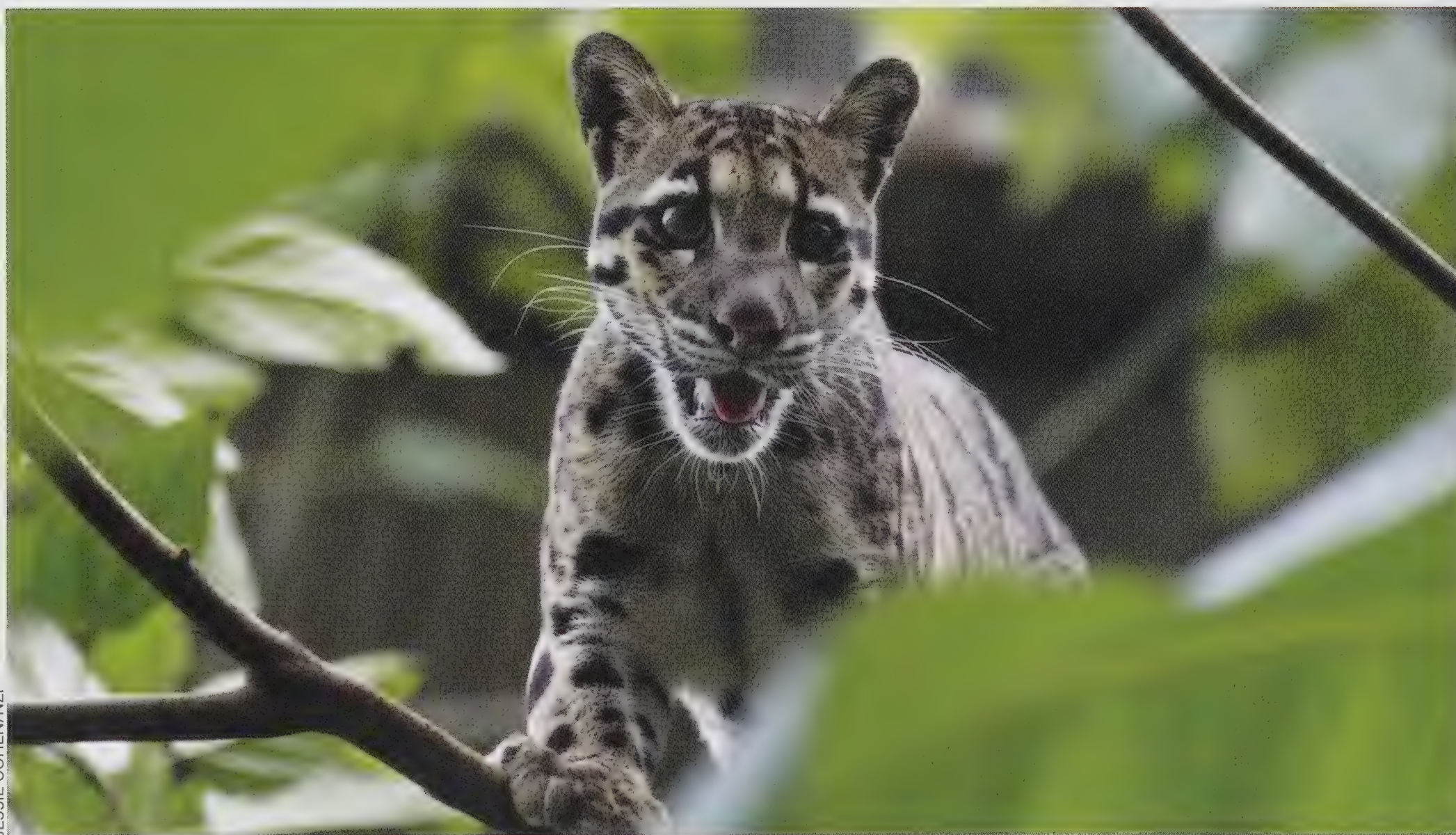
Our 2010 annual appeal will focus on constructing a new seals and seal lions exhibit. Watch your mail for information on this exciting new project.

#### CFC and United Way Participants

If you take part in the Combined Federal Campaign or United Way, please consider designating FONZ as a recipient for your donation.

**CFC:**  
Designate 11434

**United Way:**  
Designate 0967



JESSIE COHEN/NZP

### Help stamp out extinction this holiday season!

*Mail all of your holiday greetings with limited edition customized lion cub postage this year. In addition to adorning your cards with the cutest cubs in town, you also will be supporting the National Zoo's internationally acclaimed science and conservation programs. So go ahead and mail everyone on your list because you will be sending holiday cheer to the animals too! Get your stamps today at [fonz.org/stamps.htm](http://fonz.org/stamps.htm).*





# FONZ CLASSES



## ADULT/CHILD CLASSES

These programs invite adults and children to discover the Zoo together. All children must be accompanied by an adult. For everyone's safety and enjoyment, unregistered children and siblings may not attend—except for infants who do not yet crawl.

## DR. ZOO-EUSS

Turtles and elephants. Big tigers, too. Where can you find them? The National Zoo! You're sure to have a fabulous time, reading rhymes and making crafts. So come to the Zoo to meet characters from Dr. Seuss.

**AGES** 2-3  
**DATES** Nov. 6, 13, 20  
**TIME** 10-11:30 a.m.  
**FEE** \$25 per class or \$66 for all three

**NOV. 6: YERTLE THE TURTLE** — We're sticking our necks out and promising that this class will certainly stack up to the rest! Have a shell of a time in this turtle class!

**NOV. 13: HORTON HEARS A WHO** — We're all ears for this story! Read about Horton then see what Kandula, Ambika, and Shanthi, the Zoo's Asian elephants, are hearing!

**NOV. 20: THE CAT IN THE HAT** — Our cats don't wear striped hats. But they have striped fur! Learn about tigers during this Cat-urday class!

## ZOO CRAFTS

You and your child will have Zoodles of fun making animal-themed crafts for the holidays. To wrap their treasures, children will design animal-print wrapping paper and cards.

**AGES** 3-5  
**DATES** Dec. 2, 9, 16  
**TIME** 1-2:30 p.m.  
**FEE** \$90

Register Online at  
[www.fonz.org/classes.htm](http://www.fonz.org/classes.htm)

Children's classes and programs are open to FONZ members at the household level or above. Classes meet in the Visitor Center unless otherwise noted. Please note that classes do not involve direct contact with animals.

## DORA AND DIEGO ADVENTURES

¡Hola! We're going exploring. Jump into an episode—completing tasks and following the handy-dandy map to find our animal friends. We'll learn some Spanish too.

**AGES** 2-3  
**DATES** Dec. 5, 12, 19  
**TIME** 10-11:30 a.m.  
**FEE** \$25 per class or \$66 for all three

**DEC. 5: AMAZONIA** — We're headed on an adventure to South America. Grab your backpack as we explore the canopy of the rainforest, meet some jungle critters, and practice our Spanish.

**DEC. 12: ISA THE IGUANA** — This friend of Dora and Boots can now be a friend of yours! Creep on down to the Reptile Discovery Center to see our iguana. Make others green with envy by taking this class.

**DEC. 19: BOOTS THE MONKEY** — Looking for a swingin' good time? Then this class is for you. Meet our lively primate pal the golden lion tamarin. There's sure to be plenty of monkeying around in this class.

## WINNIE THE POOH

Why travel to the Hundred Acre Wood when you can see our very own Winnie the Pooh at the National Zoo? We have a Piglet, Tigger, and Eeyore too.

**AGES** 2-3  
**DATES** Jan. 9, 16, 23, 30  
**TIME** 10-11:30 a.m.  
**FEE** \$25 per class or \$66 for all three

**JAN. 9: PIGLET** — "Oh d-d-dear-dear!" Don't miss this class. Read a pig tale, make some curly crafts, and be tickled pink. You're sure to go hog wild.

**JAN. 16: WINNIE THE POOH** — Christopher Robin's favorite bear pal may have loved honey, but ours prefer bamboo. Think. Think. Think. What could be better than a day with Winnie the Pooh? A day with the Zoo's giant pandas!

**JAN. 23: EEEYORE** — Cheer up with this fabulous day of learning about donkeys. You're sure to get a kick out of it.

**JAN. 30: TIGGER** — We don't have just one tiger; we have two. Learn what makes them a wonderful thing. We're sure this class will leave you bouncing for joy!

**CHILDREN'S WEEKEND WORKSHOPS** » Parents are not encouraged to stay with the class, but may if they wish (for no charge).

## A BIKINI BOTTOM VACATION

Are you ready, kids? Escape the cold D.C. weather with a trip to Bikini Bottom. Spend time with Sponge Bob's crazy friends while learning about life below the ocean's waves.

**AGES** 4-6  
**DATES** Nov. 7, 14, 21  
**TIME** 10 a.m.-12 p.m.  
**FEE** \$28 per class or \$72 for all three

**NOV. 7: PATRICK STARFISH** — You don't have to go to the theater to see our stars! They may not be as famous as Patrick, but they're just as interesting! Make a point to attend this class and learn about our sea stars.

**NOV. 14: MR. KRABS** — Don't get crabby! Mr. Krabs's pinchy personality may be a little hard to crack, but it'll be easy to love this class.

**NOV. 21: GARY THE SNAIL** — Snails may be slow, but this class sure isn't. Dive on into the world of Sponge Bob's best friend!



## ZOO DRAWING

Come draw a writhing octopus, snake-necked turtles, and elegant cranes. In this class, young artists will develop their eye for basic shapes and fine detail as they draw Zoo animals in pencil and charcoal.

**AGES** 7 and up  
**DATES** Nov. 13, 20; Dec. 4, 11  
**TIME** 9:30 - 11:30 a.m.  
**FEE** \$120

**MORE CHILDREN'S WEEKEND WORKSHOPS ON NEXT PAGE →**



# FONZ CLASSES

## CHILDREN'S WEEKEND WORKSHOPS Continued

### THE JUNGLE BOOK

Calling all man cubs! Join the pack and have a wild time encountering our jungle animals.

**AGES** 4-6  
**DATES** Dec. 4, 11, 18  
**TIME** 10 a.m.-12 p.m.  
**FEE** \$28 per class  
or \$72 for all three

**DEC. 4: KAA** — Join us as we slither down to the Reptile Discovery Center to ssssee our python! It's going to be ssssuper!

**DEC. 11: BALOO** — Bear the cold for a pawfect day! Chill out with sloth bears and uncover the bare necessities of life. Missing this class would be unbearable!

**DEC. 18: KING LOUIE** — Head on down to "monkey city" for a royal engagement with the king of the swingers. Learn to be an ape like him and become a jungle VIP.



### MAGIC ZOO-DOM

Travel through the wonderful world of Disney, exploring magical lands and meeting fabulous creatures.

**AGES** 4-6  
**DATES** Jan. 8, 15, 22, 29  
**TIME** 10 a.m.-12 p.m.  
**FEE** \$28 per class or \$100 for all four

**JAN. 8: MULAN** — March down Asia Trail to see the Zoo's most popular animals. Learn about China's giant pandas and what the Zoo is doing to fight the war against extinction.

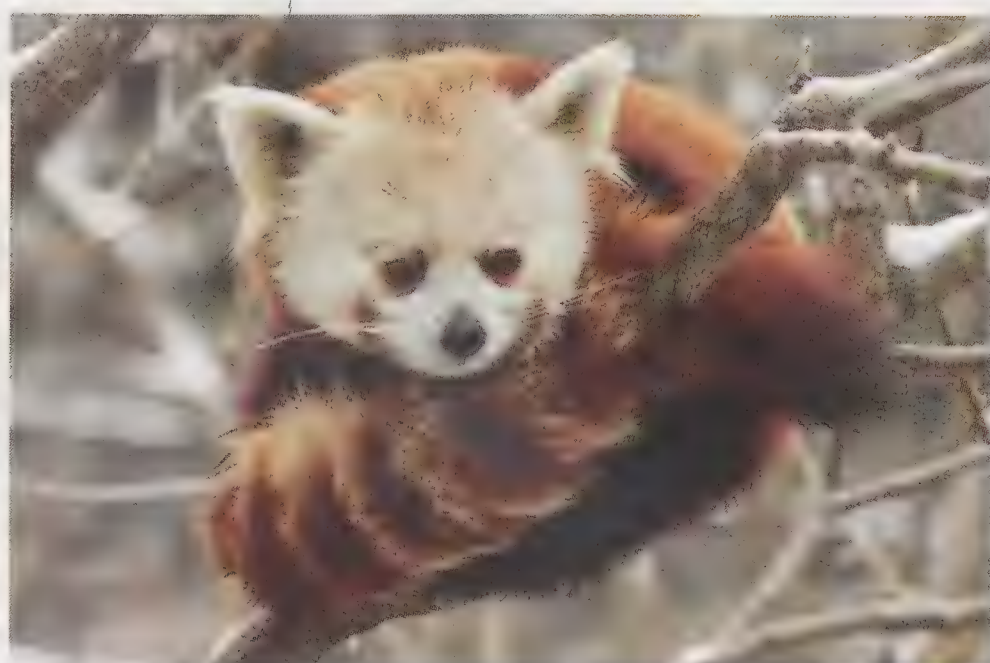
**JAN. 15: THE LITTLE MERMAID** — Les poissons! Become a part of Ariel's world as you sing and dance with Sebastian and the gang.

**JAN. 22: ALADDIN** — Jump aboard our magic carpet for a trip to a whole new world! It's going to be a grrreat day as we make striped crafts and visit the Zoo's tigers.

**JAN. 29: THE PRINCESS AND THE FROG** — Tadpoles don't need kisses to change into frogs; it's all a bit more natural than that. We're headed south, past the Bayou, for a hopping good time at Amazonia.

### HOME EDUCATION CLASSES >>>

Attention all home educators! Contact us at [fonz\\_programs@si.edu](mailto:fonz_programs@si.edu) if you are interested in setting up an education program that can meet your specific needs.



MEGHAN MURPHY/NZP



## A Wild Nature Exploration for Children in Grades K-5

**J**ust because it's winter doesn't mean you need to hibernate. The National Zoo's animals are ready to romp, and we are ready for you! Snow Safari campers will explore the lives, habitats, and conservation of animals around the world. Each five-day session includes exciting hands-on activities, craft projects, and science experiments. Participants will also meet National Zoo experts, go on exclusive tours, and experience private animal encounters. (Please note: There is never direct contact with the animals.)

### Program Options for Grades K-1

**PURR OR GROWL** The Zoo is always purring with excitement. Come meet our lions, tigers, and cheetahs. Then learn about your favorite felines through Zoo walks, science projects, and purr-fect crafts.

**WHERE THE WILD THINGS ARE** A wonderful world unfolds in this five-day investigation of the animal kingdom. Each day, kids study a different animal and learn about the wild place where it lives.

### Program for Grades 2-5

**WORLD SAFARI** Traveling at the speed of a continent a day, kids will be amazed at the fascinating animals they encounter—from lion cubs on the African plains to colorful frogs in the South American rainforest.

**AGES:** Campers are grouped into two grade levels: K-1 and 2-5. Snow Safari is not offered at the pre-K level. Children may only be registered for their current grade level.

**DATES/TIMES:** Sessions are held Monday through Friday, Dec. 27-31, from 9 a.m. to 3 p.m. Campers must be dropped off between 8:45 and 9 a.m. After-Camp Care is offered in the Visitor Center classrooms from 3 to 6 p.m. for an additional fee.

**WHERE:** All classes are held in the Visitor Center classrooms. Please pick up campers in parking lot A. Campers in After-Camp care must be picked up in the Visitor Center classrooms.

**FEES:** A current FONZ household membership or higher is required to participate. Join online at [fonz.org/join.htm](http://fonz.org/join.htm).

CAMP SESSION: \$325  
AFTER-CAMP CARE: \$125  
After Care is held in the Visitor Center classroom from 3 to 6 p.m. An additional fee will be charged after 6 p.m.

**CANCELLATION POLICY:** Cancellation requests received at least four weeks before the session will receive a 75 percent refund. Please email the FONZ Snow Safari Office at [Fonz\\_programs@si.edu](mailto:Fonz_programs@si.edu). No refunds or changes will be made for less than four weeks notice.

Registration begins November 9 at 10 a.m. To register, go to [fonz.org/camps.htm](http://fonz.org/camps.htm).

**Space is limited!**

All confirmation materials will be sent via email upon registration.





## The Animal and Eye

**"The most important thing is the eyes,"** says Don Johnson, a FONZ Photo Club member for ten years. "It's very important to have highlights in the eyes." Though Johnson generally prefers shooting outdoor animals, he spotted this rock cavy inside the Small Mammal House. Its piercing black eyes drew Johnson's focus for an inspired shot.

**Technical Notes** — CAMERA: Nikon D300;  
EXPOSURE: 1/60 second; FOCAL LENGTH: 300 mm

**Smithsonian Zoogoer** welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to [Zoogoer@si.edu](mailto:Zoogoer@si.edu). We will contact you if we are able to use your picture for the Zoo View page.



# WILD GIFTS

for the Holidays

## GREAT SHOPPING FOR A GREAT CAUSE

Tired of malls that turn into zoos during the holidays? Then find refuge at stores that know how to handle the wild—the National Zoo shops! Whether you are looking for sophisticated, educational, eco-friendly, fashionable, affordable, or entertaining gifts, you'll find them all at the Zoo and its online store. And your purchase will support the Zoo's vital work of education and conservation.

PRODUCT IMAGES COURTESY OF  
MARK VAN BERGH PHOTOGRAPHY,  
MARKVANBERGH.COM



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2



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4





## FEATURED GIFTS

Delight friends with these unique treasures.

### 1) SNOW GLOBE ZOO MONTAGE *National Zoo*

**Exclusive!** This perfect collector's item showcases animals from the National Zoo. **\$22.00**

### 2) PANDA SHOULDER BAG

Created using recycled materials and made under fair labor conditions in the Philippines, our panda shoulder bag is the perfect accent for a night out or to run around town with your essentials. **\$74.00**

### 3) PANDA COASTERS

**National Zoo Exclusive!** Mei Xiang and Tian Tian grace these sturdy, absorbent coasters. Set of four. **\$16.00**

### 4) CARVED BURL WOOD WINE HOLDER

Hand-carved from burl roots, this all-natural wine holder is as practical as it is beautiful. **\$23.00**

**5) ELEPHANT STATUE** This stately 15" piece looks like carved wood, but is made from affordable resin. **\$45.00**

**6) TIES (MAMMAL, TIGER, ZEBRA)** Be the wild one at your office with this 100% silk tie! **\$25.00**



## BARGAIN GIFTS

Wow someone special for less than \$20.

### 7) ZEBRA PASHMINA

Luxurious and soft, our 100% viscose animal print scarf measures 70 x 200 cm. **\$15.00**

### 8) NATIONAL ZOO ORNAMENT *National Zoo*

**Exclusive!** Solid brass and finished in 24-karat gold, this elegant ornament comes in a beautiful gift box. It's the perfect addition to anyone's holiday tree. **\$18.00**

### 9) PANDA SALT & PEPPER SHAKERS *National Zoo*

**Exclusive!** Separate your black and white spices with these black-and-white bears. **\$6.00**

### 10) RECYCLED ELEPHANT STATUE

Made completely from recycled plastic bags, this sculpture is unique and eco-friendly. Buy a pair for a nice cluster display. 8"/**\$12.00** 10"/**\$16.00**

### 11) WINE CORK TRIVET

Remember your favorite vintages by creating a functional and decorative trivet. Great gift idea for any wine enthusiast **\$12.00**

### 12) PANDA POO JOURNAL

This eco-friendly journal boasts handmade paper fashioned from panda dung. sm/**\$8.95** lg/**\$11.95**



### 13) BLUEBIRD CORKSCREW

The tough, rust-proof, metal mechanism opens wine bottles with ease. 8"H. Dishwasher safe. **\$15.00**

### 14) MONKEY PEELER

There's no monkey business in the kitchen with this ergonomically designed peeler! With a stainless blade, high-density plastic, and textured grip, veggies are peeled with comfort and ease. 6"L. Dishwasher safe. **\$9.00**

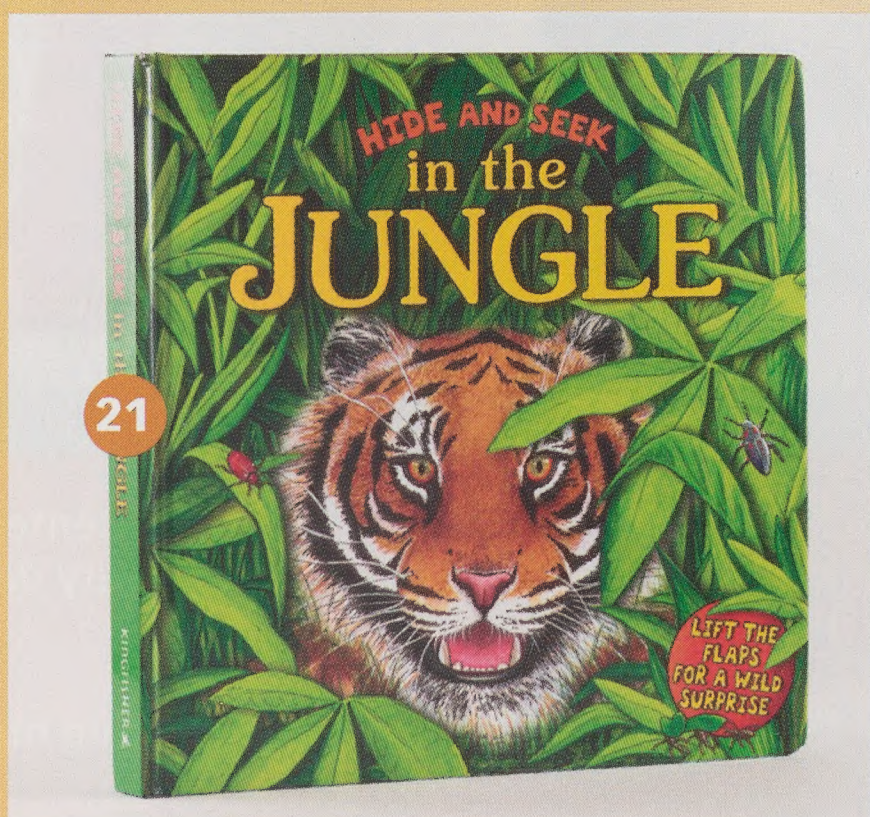
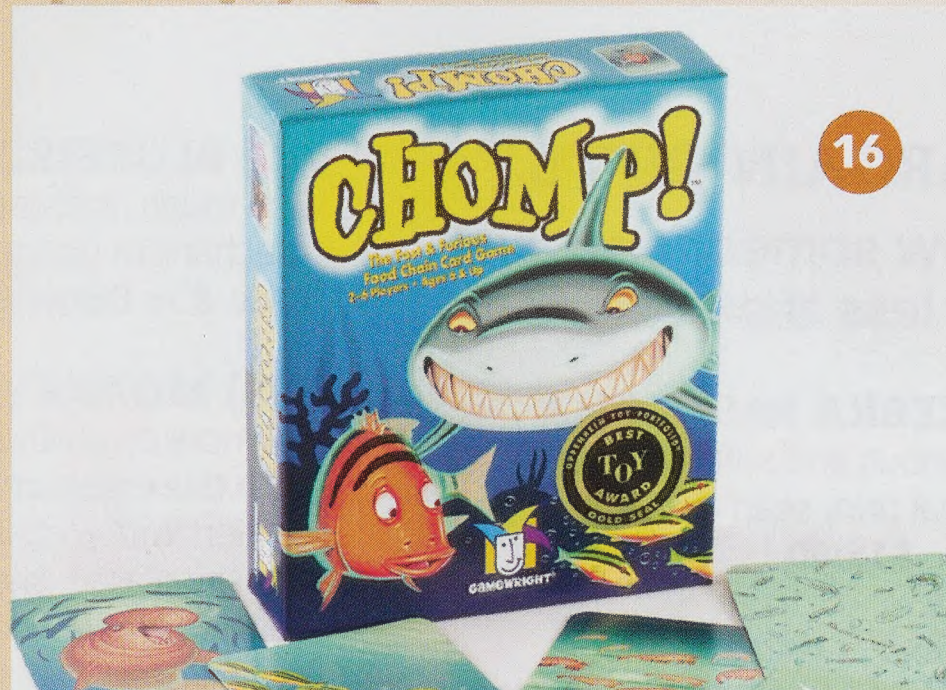
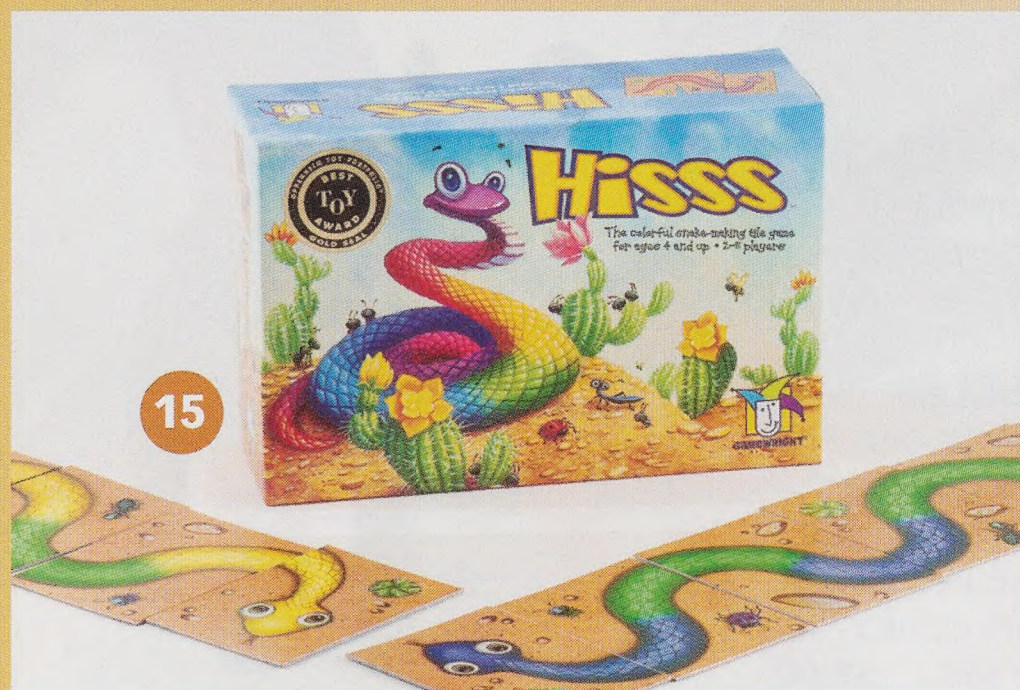


**SHOP IN PERSON** Our Visitor Center and Panda Plaza shops are open every day from 10 a.m. to 4:30 p.m.

**SHOP ONLINE** Visit [fonz.org/store.htm](http://fonz.org/store.htm).



# WILD GIFTS for the Holidays



## KIDS GIFTS

Thrill the kids in your life with these games and gifts.

**15) HISSSS** Oppenheim Toy Portfolio Gold Award  
Family Fun Magazine Toy of the Year Finalist

As each Hissss snake slithers its way across the playing area, it reinforces color identification and visual logic. Even elementary counting skills come into play! In this card game, players match colors and make snakes from heads to tails. The player with the most snakes at the end of the game wins! Ages 4 and up. **\$13.00**

**16) CHOMP** Oppenheim Toy Portfolio Gold Award  
Nick Jr. Magazine Best Toys Selection

**Dr. Toy's Best Vacation Products**  
Plunge into a fast-paced ocean world, where life is a matter of survival of the quickest, and learn about the hierarchy of ocean species. Identify the lowest creature in the food chain, then slap it before other players scarf it down. Collect all of the cards, and you are the ruler of the deep blue sea! Ages 6 and up. **\$11.00**

**17) ZOO BUCKET** Create your own wildlife park! This 33-piece set includes animals, an SUV, trees, rocks, and fencing to create your own zoo habitats. **\$16.00**

**18) PANDA IN PURSE** Your panda lover will be delighted with a National Zoo panda purse. The soft plush purse contains a removable panda. **\$12.00**

**19) HIDE AND EEEK!**  
A hundred giant elephants are running amok, but one tiny mouse has got their number! Roll the dice and move the mouse around the board, searching high and low for elephants that are either higher or lower than the number on your card. If you spot a mouse hiding on a card, shout "Eeek!" and grab the mouse figurine before it scampers away! Ages 8 and up. **\$14.00**

## SHOP IN PERSON

Our Visitor Center and Panda Plaza shops are open every day from 10 a.m. to 4:30 p.m.

## SHOP ONLINE

Visit [fonz.org/store.htm](http://fonz.org/store.htm).



**20) ENDANGO** Endango is an environmental board game that teaches kids how to go green. With a unique game strategy, it links behaviors to their indirect environmental consequences. Players earn points as they navigate the human track, affecting the fate of the endangered animals in their environment. Ages 6 and up. **\$19.99**

**21) HIDE AND SEEK IN THE JUNGLE** There's plenty to spot while looking to see what's hiding in the jungle. Three questions on each animal carefully guide the reader to seek the identity of the animal hiding in the jungle. Die-cut features on flaps reveal further clues of furry stripes, large teeth, beaks, and tails. Ages 3-5. **\$9.99**

**22) JR. PUZZLEBALL WORLD MAP** Puzzleball is a new three-dimensional jigsaw puzzle. Perfectly crafted, curved, plastic puzzle pieces allow for an exact fit and are easily assembled together to form a solid, smooth ball. No glue required! Includes stand. **\$16.00**

## PLUSH ANIMALS

These adorable animals cultivate kids' interest in wildlife.



**12" National Zoo Panda**  
*National Zoo Exclusive!*  
**\$15.00**



**16" National Zoo Panda**  
*National Zoo Exclusive!*  
**\$21.99**



**12" Lion Plush** **\$15.00**



**12" Penguin Plush**  
**\$14.00**



**24" Asian Elephant**  
**\$36.00**



**12" Red Panda Plush**  
**\$14.00**



**10" Tiger Baby Plush**  
**\$14.00**



**24" Penguin Plush**  
**\$24.95**

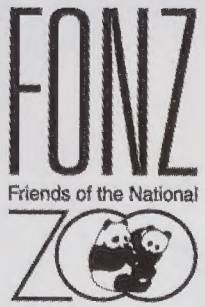


**12" Asian Elephant**  
**\$14.00**



**12" Ring-Tailed Lemur**  
**\$14.00**

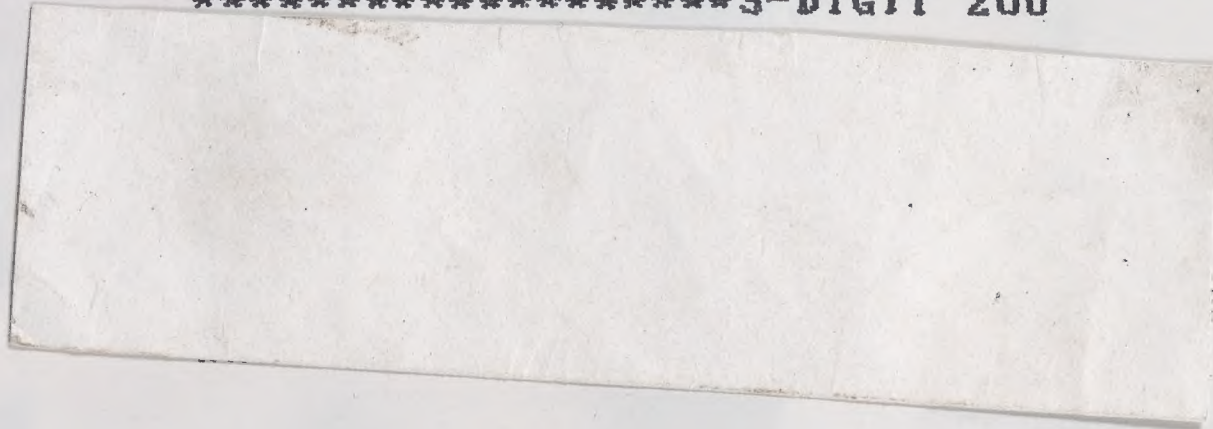




Friends of the National Zoo, PO Box 37012, MRC 5516, NW, Washington, DC 20013-7012, [www.fonz.org](http://www.fonz.org)

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Smithsonian  
*National Zoological Park*

**ZooLights. It's wild. It's free!**

Powered by Pepco

**ZooLights 2010, it's fun and full of holiday adventure!** Beginning December 3, stroll through the Smithsonian's National Zoo and experience a winter wonderland. Each night is filled with dancing trees, animated light displays, festive food and drink, the new Wildlife Park train display, live entertainment, holiday shopping, and, of course, exotic animals—both live and in lights. Event parking is available at a discount for FONZ members. Visit [fonz.org/zoolights.htm](http://fonz.org/zoolights.htm) for details. **Join us and see the Zoo in a whole new light!**

ZooLights is generously sponsored by Pepco, The Coca-Cola Company, Giant Food, SunTrust Bank, Comcast, ABC 7, TBD, FAMILY Magazine, 97.1 WASH-FM and The Washington Post/KidsPost.